AK

	Application No.	Applicant(s)
Notice of Allowability	10/815,573	YE ET AL.
	Examiner	Art Unit	
	Phallaka Kik	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Appl. filed on 4/1/04, IDS filed 1/12/05, 1/10/05, 1/7/05 & 1/4/05, interview on 11/9/05, and misc. letters filed 4/25/05 & 2/3/05.*

2. ☒ The allowed claim(s) is/are *1-35.*

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some*   c)☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a)☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1)☐ hereto or 2)☐ to Paper No./Mail Date _____ .

    (b)☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 20051109.

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date *1/12/05, 1/10/05, 1/7/05 & 1/4/05*

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20051109* .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☒ Other *See Continuation Sheet*.

DETAILED ACTION

1.   This Office Action responds to the Application filed on 4/1/2004, IDS filed on

1/12/2005, 1/10/2005, 1/7/2005 and 1/4/2005, and miscellaneous incoming letters filed

on 2/3/2005 and 4/25/2005, and interview conducted on 11/9/2005. Claims 1-35 are

pending. Claims 1-35 have been examined and are allowed, wherein claims 1-35 are

subjected to the following Examiner's Amendment.

EXAMINER'S AMENDMENT

2.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Neil A. Steinberg (Reg. No. 34,735) on 11/9/2005.

The application has been amended as follows:

In the specification:

The following texts have been inserted on a separate line, after "entirety." (page
1, line 6):

--The following are related applications:

(1.) "System and Method of Lithography Simulation ", Serial No. 10/981,914, filed

November 4, 2004, now U.S. Patent Application Publication No. 2005/0097500; (2.)

"System and Method of Lithography Simulation ", Serial No. 10/989,972, filed

November 16, 2004, now U.S. Patent Application Publication No. 2005/0091633; (3.)

"System and Method of Lithography Simulation ", Serial No. 11/024,121, filed

December 28, 2004, now U.S. Patent Application Publication No. 2005/0120327; (4.)

"System and Method of Lithography Simulation ", Serial No. 11/037,988, filed January

18, 2005, now U.S. Patent Application Publication No. 2005/0122500; and (5.) "System

and Method of Lithography Simulation", Serial No. 11/084,484, filed March 18, 2005,

now U.S. Patent Application Publication No. 2005/0166174.---

--now U.S. Patent No. 6,828,542, -- has been inserted before "may be" (page 36,

line 8).

In the drawings:

--Prior Art-- has been inserted to Figures 1, 2A and 2B as shown in the attached

drawing sheets.

In the claims:

As per **claim 1**, "hardware" (line 9) has been deleted.

As per **claim 2**, --,-- (coma) has been inserted after "claim 1" (line 1).

As per **claim 3**, --,-- (coma) has been inserted after "claim 1" (line 1);

"the Nyquist" (line 2) has been replaced with --a Nyquist--.

As per **claim 4**, --,-- (coma) has been inserted after "claim 1" (line 1);

"the numerical" (line 2) has been replaced with --a numerical--.

As per **claim 5**, --,-- (coma) has been inserted after "claim 1" (line 1).

As per **claim 6**, --,-- (coma) has been inserted after "claim 1" (line 1).

As per **claim 7**, --,-- (coma) has been inserted after "claim 6" (line 1).

As per **claim 8**, --,-- (coma) has been inserted after "claim 7" (line 1);

--each of-- has been inserted after "wherein" (line 1);

"each" (line 1) has been deleted.

As per **claim 9**, --,-- (coma) has been inserted after "claim 1" (line 1);

--, and-- has been inserted after "design" (line 2).

As per **claim 10**, --,-- (coma) has been inserted after "claim 9" (line 1);

--, and-- has been inserted after "design" (line 2).

As per **claim 11**, --,-- (coma) has been inserted after "claim 10" (line 1).

As per **claim 12**, --,-- (coma) has been inserted after "claim 10" (line 1);

"CD" (line 2) has been replaced with --critical dimension (CD)--.

As per **claim 13**, --,-- (coma) has been inserted after "claim 10" (line 1).

As per **claim 14**, --,-- (coma) has been inserted after "claim 10" (line 1);

"the coefficients" (line 3) has been replaced with --coefficients--.

As per **claim 15**, --,-- (coma) has been inserted after "claim 14" (line 1).

As per **claim 16**, --,-- (coma) has been inserted after "claim 15" (line 1).

As per **claim 17**, --,-- (coma) has been inserted after "claim 10" (line 1).

As per **claim 18**, --,-- (coma) has been inserted after "claim 17" (line 1).

As per **claim 19**, "the corresponding" (line 10) has been replaced with --a

corresponding--.

As per **claim 20**, --,-- (coma) has been inserted after "claim 19" (line 1).

As per **claim 21**, --,-- (coma) has been inserted after "claim 20" (line 1).

As per **claim 22**, --,-- (coma) has been inserted after "claim 19" (line 1);

"the Nyquist" (line 2) has been replaced with --a Nyquist--.

As per **claim 23**, --,-- (coma) has been inserted after "claim 19" (line 1);

"the numerical" (line 2) has been replaced with --a numerical--.

As per **claim 24**, --,-- (coma) has been inserted after "claim 19" (line 1);

"the plurality" (line 2) has been replaced with --a plurality--.

As per **claim 25**, --,-- (coma) has been inserted after "claim 19" (line 1);

--each of-- has been inserted after "wherein" (line 1);

"each" (line 1) has been deleted;

"the corresponding" (line 2) has been replaced with --a corresponding--.

As per **claim 26**, --,-- (coma) has been inserted after "claim 19" (line 1);

--and-- has been inserted before "wherein" (line 2).

As per **claim 27**, --,-- (coma) has been inserted after "claim 26" (line 1);

--, and-- has been inserted after "design" (line 2).

As per **claim 28**, --,-- (coma) has been inserted after "claim 27" (line 1);

"microprocessor subsystems" (line 2) has been replaced with --microprocessor

subsystem--.

As per **claim 29**, --,-- (coma) has been inserted after "claim 27" (line 1);

"microprocessor subsystems" (line 2) has been replaced with --microprocessor

subsystem--;

"CD" (line 2) has been replaced with --critical dimension (CD)--.

As per **claim 30**, --,-- (coma) has been inserted after "claim 27" (line 1);

"microprocessor subsystems" (line 2) has been replaced with --microprocessor

subsystem--.

As per **claim 31**, --,-- (coma) has been inserted after "claim 27" (line 1);

"microprocessor subsystems" (line 2) has been replaced with --microprocessor

subsystem--;

"the coefficients" (line 3) has been replaced with --coefficients--.

As per **claim 32**, --,-- (coma) has been inserted after "claim 31" (line 1);

As per **claim 33**, --,-- (coma) has been inserted after "claim 32" (line 1);

As per **claim 34**, --,-- (coma) has been inserted after "claim 27" (line 1);

"microprocessor subsystems" (line 2) has been replaced with --microprocessor

subsystem--.

As per **claim 35**, --,-- (coma) has been inserted after "claim 34" (line 1).

Drawings

3.   The following changes to the drawings have been approved by the examiner and

agreed upon by applicant: --Prior Art-- label has been added to Figures 1, 2A and 2B as

given in the Examiner's Amendment above and shown in the attached drawing sheets,

since only that which is old is illustrated (see page 2 of Applicant's specification; see

MPEP § 608.02(g)). In order to avoid abandonment of the application, applicant must

make these above agreed upon drawing changes.

4.   Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to

the Office action to avoid abandonment of the application. The replacement sheet(s)

should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so

as not to obstruct any portion of the drawing figures. If the changes are not accepted by

the examiner, the applicant will be notified and informed of any required corrective

action in the next Office action. The objection to the drawings will not be held in abeyance.

Compact Disc Submission

5.   Although the CD-ROM submissions filed on 1/10/2005 and 1/4/2005 are not in compliance with 37 CFR 1.52(e) (i.e., providing proper transmittal letter with appropriate statements thereof, providing 2 copies of each CD-ROM containing ASCII files only, proper labeling of each CD-ROM, proper reference to the CD-ROM in applicant's specification), these requirements are waived because the CD-ROM contains only copies of the U.S. patents and U.S. patent application publications cited in the IDS filed on 1/10/2005 and 1/4/2005, wherein Applicant is NO LONGER required to submit copies of U.S. patents and U.S. patent application publications in applications filed after June 30, 2003 or entered the national stage under 35 U.S.C. 371 after June 30, 2003. (see MPEP § 609 (III)(A)(2)).

Allowable Subject Matter

6.   **Claims 1-35** are allowed.

7.   The following is an examiner's statement of reasons for allowance:

As per **claims 1-18**, claim 1, from which the claims depend, recites a system for simulating a lithographic design comprised of a plurality of polygons arranged in a predetermined configuration, comprising the inventive features of having an accelerator subsystem, coupled to the microprocessor subsystem, to calculate at least a portion of an aerial image of the lithographic design using the pixel-based bitmap representation of the lithographic design, wherein the accelerator subsystem includes a plurality of

programmable gate arrays configured to process the pixel data in parallel, as claimed,

which the prior arts made of record failed to teach or suggest. In particular, the prior

arts made of record teach various methods/systems for simulating/testing/evaluating

lithographic or mask or photomask designs, including involving the conversion of

polygons to pixel-based bitmap representation, generating of aerial images and

performing limited parallel data processing (see especially **Gortych et al.**, U.S. Patent

No. 5,680,588, col. 15, line 24 to col. 16, line 31; **Noyama et al.**, U.S. Patent No.

5,594,850, especially col. 4, line 57 to col. 5, line 34; col. 9, lines 28-46; col. 13, lines

24-30; **Sandstrom**, U.S. Patent No. 6,285,488, especially col. 4, lines 44-67; **Wolfe et

al.**, U.S. Patent No. 6,372,391, especially col. 8, line 8 to col. 9, line 8; **Klatchko et al.**,

U.S. Patent Application Publication No. 2003/0107770, especially paragraphs [0030]-

[0033], [0085]; Fig. 6; **Ye et al.**, U.S. Patent Application Publication No. 2004/022354,

paragraph [0160]). However, none of the prior arts made of record, alone or in

combinations, teaches or suggests the inventive features as claimed. Accordingly, the

claimed invention is novel and un-obvious over the prior arts made of record.

As per **claims 19-35**, claim 19, from which the claims depend, recites a system

for simulating a lithographic design comprising the inventive features of having a

plurality of accelerator subsystems, each accelerator subsystem includes a plurality of

programmable integrated circuits configured to process the pixel data in parallel and

each accelerator subsystem is connected to an associated microprocessor to calculate

a portion of the aerial image of the lithographic design using the corresponding portion

of the pixel-based bitmap representation of the lithographic design, as claimed, which

the prior arts made of record failed to teach or suggest. In particular, the prior arts made of record teach various methods/systems for simulating/testing/evaluating lithographic or mask or photomask designs, including involving the conversion of polygons to pixel-based bitmap representation, generating of aerial images and performing limited parallel data processing (see especially prior arts cited in the reasons for allowance of claims 1-18 above). However, none of the prior arts made of record, alone or in combinations, teaches or suggests the inventive features as claimed. Accordingly, the claimed invention is novel and un-obvious over the prior arts made of record.

Conclusion

8.   Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

9.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phallaka Kik whose telephone number is 571-272-1895. The examiner can normally be reached on Monday-Friday, 6:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Any response to this action should be mailed to:

Commissioner for Patents

P. O. Box 1450

Alexandria, VA 22313-1450

or faxed to:

571-273-8300

PK
November 10, 2005

MATTHEW SMITH
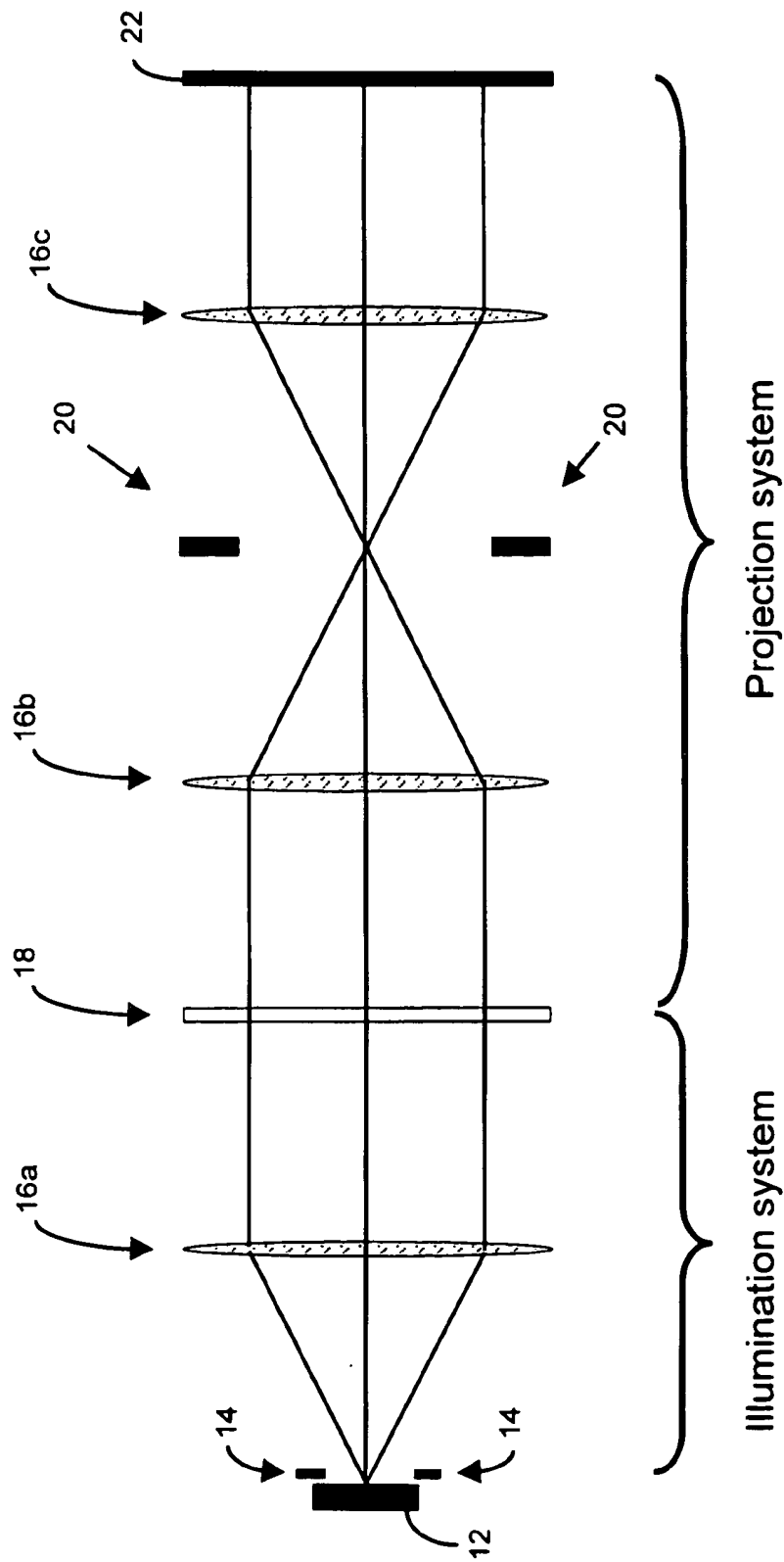SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

FIGURE 1 PRIOR ART

FIGURE 2A

PRIOR ART

FIGURE 2B

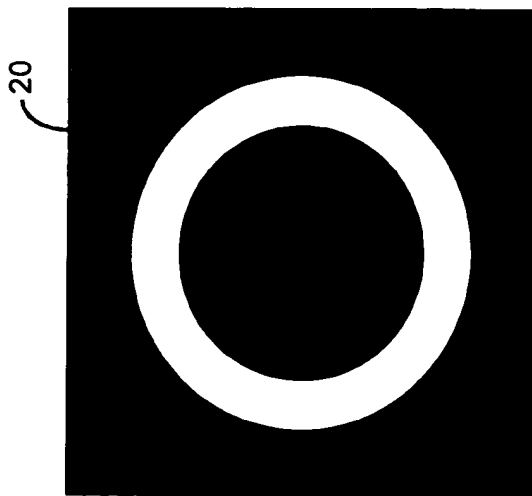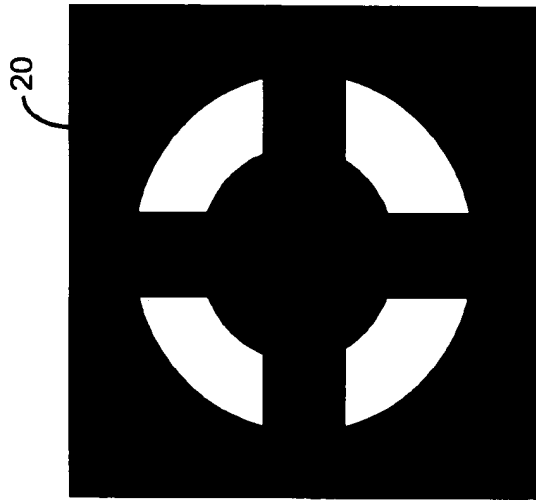*PRIOR ART*

Continuation of Attachment(s) 9. Other: 2 drawing sheets containing Figures 1, 2A, 2B.